

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER CRC 511	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Projecting the Retention of Navy Careerists		5. TYPE OF REPORT & PERIOD COVERED
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Aline O. Quester James S. Thomason		8. CONTRACT OR GRANT NUMBER(s) N00014-83-C-0725
9. PERFORMING ORGANIZATION NAME AND ADDRESS Center for Naval Analyses 2000 No. Beauregard Street Alexandria, Virginia 22311		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Office of Naval Research Department of the Navy Arlington, Virginia 22317		12. REPORT DATE December 1983
		13. NUMBER OF PAGES 31
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Office of the Chief of Naval Operations (Op91) Department of the Navy Washington, D.C. 20350		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release. Distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES This Research Contribution represents the best opinion of CNA at the time of issue. It does not necessarily represent the opinion of the Department of the Navy.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Civilian personnel, Employment, Enlisted personnel, Estimates, Naval personnel, Personnel retention, Reenlistment, Salaries		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report quantifies the link between civilian job growth and military retention for Navy enlisted personnel. The magnitude of this effect is identified--at both the first and second reenlistment decision points--for highly technical ratings and for ratings which are not highly technical. The effect that future civilian job growth will have on the chances that Navy personnel will reenlist or leave is then projected, using occupational forecasts for the next decade provided by the Bureau of Labor Statistics.		

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PROJECTING THE RETENTION OF NAVY CAREERISTS

Aline O. Quester
James S. Thomason



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CRC 511 / December 1983

PROJECTING THE RETENTION OF NAVY CAREERISTS

Aline O. Quester
James S. Thomason



Naval Studies Group

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ABSTRACT

This report quantifies the link between civilian job growth and military retention for Navy enlisted personnel. The magnitude of this effect is identified--at both the first and second reenlistment decision points--for highly technical ratings and for ratings which are not highly technical. The effect that future civilian job growth will have on the chances that Navy personnel will reenlist or leave is then projected, using occupational forecasts for the next decade provided by the Bureau of Labor Statistics.

EXECUTIVE SUMMARY

Concerns have been expressed in Congress, professional journals, and the popular press that the military will have great difficulty in the next decade retaining the highly technical personnel it will require. As projections for the civilian economy indicate an increased demand for technically trained personnel, these concerns are not unreasonable.

→ This report quantifies the link between civilian job growth and military retention for Navy enlisted personnel. We identify the magnitude of this effect--at both the first and second reenlistment decision points--for highly technical ratings and for ratings which are not highly technical. We then gauge the impact that projected civilian job growth will have on the chances that Navy personnel will reenlist or leave. For this we use occupational projections for the next decade provided by the Bureau of Labor Statistics.

Previous work has successfully related reenlistment probabilities to both demographic characteristics and economic variables. The Annualized Cost of Leaving Model (ACOL), developed by Warner [1], is used by the Navy to project the effect of different pay and bonus packages on the reenlistment rate. The model is now being enlarged so that reenlistment rates can be estimated for all services.

Annualized cost-of-leaving models have been most successful in projecting the short-term effects on retention of different pay packages. But they are not designed for longer-term projections. It would be useful for Navy force planners to be able to more reliably project future first- and second-term reenlistment rates 5 or even 10 years ahead. Longer lead time to deal with significant changes can mean more prudent, efficient use of resources and less "catch-up ball."

The reason existing reenlistment models have not been especially useful for longer-term projections is simple. The ratio of military to civilian compensation drives these models, but it is difficult to project civilian wage levels accurately. The difficulty is compounded when one wants to project future pay in specific occupations. Even if we had such projections, no one would place much confidence in them.

There is another approach. For the civilian sector, considerably more effort has been devoted to, and much more credence is placed in, projections of job openings on an occupation-by-occupation basis [2]. Our strategy here will be to help the Navy exploit these job projections in devising its retention policies. To do so, we model the pull of particular civilian occupations on specific Navy ratings by reference to civilian job growth rather than civilian wage levels. In this way, we estimate the historical relationship between Navy reenlistment rates in specific ratings and prevailing rates of employment growth in comparable

civilian jobs, statistically controlling for other key determinants of Navy retention. Then, we project key Navy reenlistments out to 1990 under two major economic scenarios established by the Bureau of Labor Statistics.

Overall, these projections reveal that, by 1990, even after controlling for observed historical differences to date in military pay and other key factors in our model, technically oriented second-term sailors are likely to reenlist for a third term at rates at least 3 to 7 percentage points less than other sailors. This result has a number of implications for future military manpower policy and research. In terms of policy, the most important is that the current Selective Reenlistment Bonus program should be more heavily tilted toward the technical ratings than it has been. Additional research along these lines can specify the optimal tilt, but the direction is clear.

Our findings also offer clear evidence that reenlistment rates in at least one branch of the U.S. military do respond systematically to changes in the civilian economy. More importantly, they show different types of rated Navy personnel responding differently to changes in the civilian economy. Specifically, the more experienced technical enlisted personnel in our Navy sample are more likely than others to leave the service in response to equal increases in the numbers of comparable civilian jobs, other things being equal. This is an intuitively and theoretically appealing result, but it was not by any means a foregone conclusion. These particular findings ought to strengthen the conviction of those who advocate well-targeted reenlistment bonuses as an especially efficient use of taxpayer's dollars in meeting military retention goals.

To target reenlistment bonuses most efficiently, more research along these lines seems worthwhile. At a minimum, a comparable look at the other services would be useful. In our judgment, though, the most prudent course for the Department of Defense would be to develop a policy tool that synthesizes the short-term advantages of a civilian-wage-oriented retention model like ACOL and the longer-term projection capabilities of the job-growth-centered model of military retention that we have begun to build here.

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INTRODUCTION

Concerns have been expressed in Congress, professional journals, and the popular press that the military will have great difficulty in the next decade retaining the highly technical personnel it will require. As projections for the civilian economy indicate that the demand for technically trained personnel will grow, these concerns are not unreasonable.

This report quantifies the link between civilian job growth and military retention for Navy enlisted personnel. We identify the magnitude of this effect--at both the first and second reenlistment decision points--for highly technical ratings and for ratings which are not highly technical. We then gauge the impact that projected civilian job growth will have on the chances that Navy personnel will reenlist or leave.

Research of this sort is important for the military. It promotes understanding of civilian competition for trained military personnel. It can assist the Department of Defense and the individual services in planning the right military compensation packages to cope with changes in the U.S. economy. More specifically, the services can exploit the results to better identify the pay or bonuses required to meet reenlistment goals.

THE REENLISTMENT MODEL

Previous work has successfully related reenlistment probabilities to both demographic characteristics and economic variables. The Annualized Cost of Leaving Model (ACOL), developed by Warner [1], is used by the Navy to project the effect of different pay and bonus packages on the reenlistment rate. The model is now being enlarged so that reenlistment rates can be estimated for all services.

Models of this type have been most successful in projecting the short-term effects on retention of different pay packages. But they are not designed for longer-term projections. It would be useful for Navy force planners to be able to more reliably project future first- and second-term reenlistment rates 5 or even 10 years ahead. Longer lead time to deal with significant changes could mean more prudent, efficient use of resources and less "catch-up ball."

The reason existing reenlistment models have not been especially useful for longer term projections is simple: the ratio of military to

The authors wish to express their appreciation to Mr. Craig Goodwyn for computer assistance in this project and to Cdr. Kurt Driscoll (USN, Retired), Cdr. Lawrence Curran (USN), and Mr. C.A. Mailer for their help with the civilian occupation/Navy rating crosswalk.

civilian compensation drives these models, and civilian wage levels are hard to predict accurately. The difficulty is compounded when one wants to gauge future pay in specific occupations. Even if we had such projections, no one would place much confidence in them.

There is another approach. For the civilian sector, considerably more effort has been devoted to, and much more credence is placed in, projections of job openings on an occupation-by-occupation basis [2]. Our purpose in the analysis described here was to help the Navy exploit these job projections in devising its retention policies. To do so, we modeled the pull of particular civilian occupations on specific Navy ratings by reference to civilian job growth rather than civilian wage levels. The model allowed us to estimate the historical relationship between Navy reenlistment rates in specific ratings and prevailing rates of employment growth in comparable civilian jobs, controlling for other key determinants of Navy retention.

We designed the model with the explicit constraint that the explanatory variables be easy to project. The next section describes the data and variables we used to estimate this historical relationship and then to project key Navy reenlistments out to 1990 under two major economic scenarios established by the Bureau of Labor Statistics.

DATA AND VARIABLES

From the Navy's master files for enlisted personnel, we built a data set consisting of those sailors who were at a reenlistment decision point and eligible to reenlist in any one of the five fiscal years between 1978 and 1982, inclusive. In all, there were over a quarter of a million individuals. We divided them along three dimensions: first, by the Navy occupational rating they were serving in; secondly, by the fiscal year in which they were making a reenlistment decision; and, finally, by whether they were making a first (zone A) or second (zone B) reenlistment decision. The unit of observation or cell in our analysis thus consisted of Navy enlisted personnel in a given rating who made a reenlistment decision in a given year. Since there were five fiscal years of available data and about 100 ratings, there were potentially about 500 cells or observations for each decision point. In sum, we constructed a pooled, cross-sectional time-series set of grouped data on reenlistment rates in particular Navy ratings.

Table 1 summarizes the variables we used. The remainder of this section offers some more specific information about each of these variables.

Reenlistment Rates

Each unit of observation consists of personnel in a given rating making a reenlistment decision in a given fiscal year. The dependent variable we used was the percentage of personnel in each observation

(cell) who decided to reenlist. While there is a range of possible alternatives here, this is the most common-sensical and popular index of retention.

TABLE 1

VARIABLES USED IN THE MODEL

REEN:	Percent of eligibles in rating who reenlist or extend for 36 or more months.
TECHGRO:	The percentage growth in comparable civilian jobs for technical ratings; zero for all other ratings. Technical ratings are those defined as "high" skill/technology level by Op-110C (5 Sep 1980). They include AC, AE, AQ, AT, AX, CTI, CTM, CTT, DS, ET, EW, FTB, FTG, FTM, MT, STG, STS, and TD. Note that CTI and CTT had no civilian counterparts.
NOTECHGRO:	The percentage growth in comparable civilian jobs for non-technical ratings; zero for all other ratings.
FEM:	Dummy variable (equals 1 if comparable civilian occupation is more than 80 percent female; otherwise zero). Navy ratings coded as 1 here are AK, AZ, DK, DP, HM, MS, PN, DT, SK, and YN.
UR2024:	Unemployment rate for 20- to 24-year-old males.
BONUS:	SRB level (zone A or zone B) multiplied by the average pay-grade in the rating (deflated by an index of real military pay, 1978 = 1.00)
MILPAY:	Index of Real Military Pay (RMC) deflated by consumer price (1978=1.00)
DEPEND:	Percent of eligibles with dependents.

A more complex, nonlinear specification, called the logit and estimated by maximum likelihood, gave even stronger results. But, since the two sets of estimates are so similar, we focus on the simpler and more familiar of the two forms here in the main text of this paper. For interested readers, the logit results are offered in appendix A.

Civilian Job Growth

To relate changes in reenlistment rates to rates of growth in comparable civilian jobs, we first needed to match Navy ratings with civilian counterparts. Technically, such a match is called a

"crosswalk." A major crosswalk effort is now underway in the Department of Defense, but unfortunately it was not complete when this analysis was undertaken. Moreover, conversations with DoD personnel involved in that project suggested that it would be unwise to use previously published crosswalks.

Rather than wait for the new crosswalk, we built our own. Two Naval officers and the Deputy Director, Occupational Classification Review, NMPC compared a list of civilian occupations from the Bureau of Labor Statistics categories with the Navy enlisted ratings. Each expert independently matched civilian occupations to Navy ratings. We considered civilian and military occupations to be comparable when all three individuals agreed on the match. The results are provided in appendix B.

For each rating with civilian matches, we next wanted to measure the amount of recent growth in numbers of these comparable civilian jobs that members of the rating faced during the fiscal year they made a decision to reenlist or not. Our expectation was that the greater the growth, the lower the Navy reenlistment rate would be, other things equal.

We measured the civilian job growth as follows. First, we considered Navy ratings identified as having one comparable civilian occupation. For each fiscal year between 1978 and 1982, we used the simple annual percentage increase in numbers of comparable civilian nationwide jobs as reported by the Bureau of Labor Statistics. For fiscal year 1978, for example, we used the percentage increase between FY 1977 and FY 1978. For Navy ratings with more than one comparable occupation, we employed an analogous measure: a weighted average annual percentage increase in civilian jobs. The portion of all comparable jobs associated with each comparable occupation in the base year was used as the weight.

We believe that sailors with skills that are specifically salable in the civilian economy are more likely to leave the service than sailors without such skills, other things being equal. Moreover, we specifically wanted to test the hypothesis that reenlistment rates in relatively "technical" Navy ratings are more sensitive to civilian job growth than such rates in less technical ratings.

Thus, we divided all the Navy ratings with civilian matches into two groups, "highly technical" and "less technical," and constructed two job growth variables. Highly technical ratings received a score equal to their annual civilian job growth rates in each fiscal year on a variable we label TECHGRO, and a score of zero on a second variable, NOTECHGRO. Less technical ratings were coded in the reverse manner on these two variables. As implied above, for some ratings our panel of experts simply could not identify any comparable civilian occupation;

these ratings provided the omitted (intercept) category in the regression analysis.

A final but more subtle occupational distinction involved jobs that in the Navy are mainly performed by men but in the civilian sector are almost exclusively done by females. In these cases there is a clear match between the rating and a civilian occupation in terms of skill requirements, but a gender-based barrier, albeit an informal one, may inhibit comparable movement from such Navy ratings to their civilian counterparts. Our expectation here, therefore, was that the reenlistment rate in such ratings, at least among males, will be higher than in other ratings, other things being equal. To empirically assess this hypothesis, ratings for which the civilian occupational counterparts are over 80 percent staffed by females were coded as a distinctive group (FEM=1).

Controls

To isolate the effects of these civilian job growth variables from other influences on reenlistment rates, we included three other key factors in our retention model: differences in the prevailing unemployment rate, the level of real military pay, and the proportion of potential reenlistees in each cell with dependents. Almost all prior research has shown these factors to be especially powerful determinants of military retention rates [3, 4].

Unemployment Rate. We would expect a direct, positive relationship between reenlistment rates and the prevailing aggregate unemployment rate: when there are relatively few alternative job possibilities, people try to keep their jobs. The overall unemployment rate should capture aggregate differences in the national market over time. Indeed, only if specific civilian occupations comparable to Navy ratings behaved differently over time from the overall job market would we expect to observe a significant relationship between our rating-specific job growth variables and Navy reenlistment rates.

Military Pay. We also wanted to control for retention differences due to variation in military pay levels. To do so we used two complementary variables. The first, MILPAY, was used primarily to capture differences over time in the real value of Regular Military Compensation (RMC). The second, BONUS, was constructed to control for any differences across ratings or over time that might be attributable to differences in reenlistment bonus offers.

These pay variables were not intended to measure military pay relative to civilian pay for a given specialty. Rather, in this model we wanted our occupation-specific measures of job growth to capture any key changes in job markets related to individual ratings. This strategy was intended to show the historical responsiveness of reenlistment rates to civilian job growth and to any changes in civilian wages associated with that job growth. Ultimately, with this type of estimate, we should be able to project the likely effect on reenlistment rates in specific Navy ratings of expected future job growth in comparable civilian occupations.

Dependents. Lastly, sailors with family dependents are known to reenlist at appreciably higher average rates than otherwise comparable sailors without dependents. Explanations for this difference probably include both relatively higher levels of risk aversion among sailors with dependents as well as the fact that the military explicitly pays sailors with dependents more than it pays otherwise comparable single sailors. For both reasons, we would expect higher proportions of singles to leave if other things are equal. Though we have yet to see a full explanation for this difference in retention behavior, the effect has certainly been strong enough in past empirical analyses to warrant our including a control variable in this model. For each cell in our data set, the variable `DEPEND` measures the proportion of sailors with primary dependents.

INITIAL ESTIMATES

This section presents our empirical estimates of the link between civilian job growth and Navy reenlistment rates, based on the weighted least-squares regression model. This model differs from ordinary least-squares models in that the larger cells are assumed to be more important in estimating the coefficients. This assumption is particularly appropriate when working, as we were, with grouped data in which cells vary greatly in size. In short, we use this weighting procedure to improve the accuracy of the estimates. Overall, however, we may interpret these results as though they were based on an ordinary least-squares regression.

For context, table 2 first recaps our expectations as described above and then presents the basic empirical results. Table 3 provides estimates of the regression equations and relevant summary statistics.

The first important aspect of these results is that all the "control" variables relate to reenlistment rates in the expected direction and are almost always significant at both decision points. Given the exploratory nature of this research, the clarity of this pattern is gratifying: it is in line with well-established conventional wisdom. A

markedly different set of results would have been both surprising and puzzling.

TABLE 2

DETERMINANTS OF NAVY REENLISTMENTS: EXPECTATIONS AND FINDINGS

	<u>Expected effect on reenlistment</u>	<u>Observed effect (first reenlistment)</u>	<u>Observed effect (second reenlistment)</u>
<u>Job variables</u>			
TECHGRO	-	-	- ^a
NOTECHGRO	-	0	0
FEM	+	+ ^a	+ ^a
<u>Control variables</u>			
UR2024	+	+ ^a	+ ^a
MILPAY	+	+ ^a	+ ^a
BONUS	+	+ ^a	+ ^a
DEPEND	+	+ ^a	+ ^a

^aStatistically significant at the 1-percent level.

Secondly, the pattern of results for the "job" variables in the model is especially interesting. Two of the three sets of coefficients are in the expected direction at both decision points (NOTECHGRO is the exception), but the results are strongest at the second decision point: only one coefficient is significant (statistically) at the first decision point, while two of the three are significant and in the expected direction at the second. Again, NOTECHGRO is the exception.

Taken together, these results are revealing. Among relatively experienced sailors in the more technical Navy ratings, changes in specific job opportunities do appear to systematically affect reenlistment rates. The coefficient on TECHGRO, which is in the expected direction at both decision points and significant statistically at the second, is at least preliminary evidence that we are tapping a powerful link between the military and civilian economies.

Before making major policy choices based on this exploratory work, however, more extensive analysis of the phenomenon seems prudent. But we do believe it useful now to provide at least an initial set of reenlistment projections for Navy technical ratings. These projections

TABLE 3
ESTIMATES OF NAVY RETENTION

	First reenlistment (zone A)	Second reenlistment (zone B)
<u>Job variables</u>		
TECHGRO	-0.316 (1.02)	-2.07 (-5.18)
NOTECHGRO	-0.005 (0.03)	-0.03 (0.09)
FEM	7.99 (8.70)	12.64 (8.59)
<u>Control variables</u>		
UR2024	1.63 (8.65)	2.02 (5.99)
MILPAY	22.68 (2.71)	63.2 (5.75)
BONUS	0.252 (7.04)	0.128 (2.41)
DEPEND	0.978 (15.69)	1.24 (17.2)
<u>Constant</u>	-58.8 (-7.48)	-131.3 (-10.95)
<u>Mean dependent</u>	26.9	52.6
<u>F-statistic</u>	240.0	428.8
<u>Number of observations</u>	467	463

NOTE: Observations are weighted by the square root of the number of observations in each cell. The numbers in parentheses are t statistics.

combine the historical estimates we have just presented with projections of civilian job growth developed by the Bureau of Labor Statistics.

PROJECTIONS

This section describes the most likely effect on enlisted retention of projected future growth in those civilian occupations most comparable to particular Navy ratings. We focus on the most technical ratings at the second reenlistment decision point (zone B).

The Bureau of Labor Statistics (BLS) projects total numbers of future job openings by occupation. Using BLS projections through 1990 for each civilian occupation that we matched earlier to Navy ratings [5], we calculated annual growth rates in comparable civilian jobs for each technical rating shown in table 4. Since the BLS develops both "low" and "high" economic growth scenarios, we have specified these growth rates in comparable civilian jobs for each scenario. They are displayed in the first two columns of the table.

TABLE 4
PREDICTIONS FOR 1990:
EFFECT OF CIVILIAN JOB OPPORTUNITIES
ON ZONE B REENLISTMENTS

<u>Navy ratings</u>	<u>Average annual projected growth (percent)</u>		<u>Projected effect on reenlistment rate (percentage points)</u>	
	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
AC	1.5	1.7	-3.0	-3.4
AE	2.1	2.9	-4.2	-5.8
AQ, AT, AX, CTM, EW, FT, MT, STG, STS	2.6	3.6	-5.2	-7.2
DS	2.3	3.1	-4.6	-6.2
ET	2.3	3.1	-4.6	-6.2

The last two columns of table 4 specify projected differences in zone B retention rates, by 1990, between each technical rating shown and the average nontechnical rating. To construct these estimates, we

combined the projected rates in the first two columns with the results of the second reenlistment equation reported above in table 3, results which indicate that zone B retention rates in technical ratings will be about 2 (2.07) percentage points lower than retention rates in the average nontechnical rating for each percentage point of average annual growth in comparable civilian jobs. Since we held other factors constant in these projections, the differences shown are attributable to what we estimate to be the stronger pull on technical than on non-technical Navy enlisted personnel of job growth in comparable civilian occupations over this decade.

Overall, these projections reveal that, by 1990, even after controlling for observed historical differences to date in military pay and other key factors in our model, technically oriented second-term sailors are likely to reenlist for a third term at rates at least 3 to 7 percentage points less than other sailors. This result has a number of implications for future military manpower policy and research. In terms of policy, the most important is that the current Selective Reenlistment Bonus program should be more heavily "tilted" toward the technical ratings than it has been. Additional research along these lines can specify the optimal tilt, but the direction is clear.

CONCLUSIONS

These findings offer clear evidence that reenlistment rates in at least one branch of the U.S. military do respond systematically to changes in the civilian economy. More importantly, they show that different types of rated Navy personnel respond differently to changes in the civilian economy. Specifically, the most experienced technical enlisted personnel in our Navy sample are more likely than others to leave the service in response to increases in the numbers of comparable civilian jobs, other things being equal. This is an intuitively and theoretically appealing result, but it was not by any means a foregone conclusion. These particular findings ought to strengthen the conviction of those who advocate well-targeted reenlistment bonuses as an especially efficient use of taxpayers' dollars in meeting military retention goals.

To target reenlistment bonuses most efficiently, more research along these lines seems worthwhile. At a minimum, a comparable look at the other services would be useful. In our judgment, though, the most prudent course for the Department of Defense would be to move ahead vigorously to develop a policy tool that synthesizes the short-term advantages of a civilian-wage-oriented retention model like ACOL and the longer-term projection capabilities of the job-growth-centered model of military retention that we have begun to build here.

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APPENDIX A

LOGIT SPECIFICATION OF THE RETENTION EQUATIONS

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LOGIT SPECIFICATION OF THE RETENTION EQUATIONS

This appendix provides the detailed results of a logit specification of the zone A and zone B reenlistment equations. Inspection of these coefficients will reveal an extremely high degree of correspondence between these results and those presented in table 3 of the main report.

TABLE A-1

MAXIMUM LIKELIHOOD ESTIMATES OF RETENTION (LOGIT)^a

	First Reenlistment (zone A)		Second Reenlistment (zone B)	
	Logit coefficient	Derivative at the mean x 100	Logit coefficient	Derivative at the mean x 100
TECHGRO	-0.020 (-3.76)	-0.338	-0.092 (-14.02)	-2.303
NOTECHGRO	0.0002 (0.06)	0.003	0.0006 (0.11)	0.015
FEM	0.453 (30.54)	7.553	0.530 (22.40)	13.226
UR 2024	0.097 (29.49)	1.622	0.089 (16.14)	2.229
MILCPI	1.061 (7.52)	17.685	2.676 (15.04)	66.825
BONUS	0.014 (23.09)	0.234	0.005 (6.24)	0.136
DEPEND	0.062 (53.00)	1.027	0.055 (43.82)	1.384
Constant	-5.974 (-45.566)	--	-7.882 (-39.39)	--
Chi square	5937.4		4668.9	

^aIn the logit specification the dependent variable is $\ln\left(\frac{R}{1-R}\right)$ and the weight is $\sqrt{(Obs)(R)(1-R)}$. We estimated the logit model by maximum likelihood techniques using Newton's algorithm; starting values were derived from generalized weighted least-squares estimates of $\ln\left(\frac{R}{(1-R)}\right)$. To obtain the slope (derivative) of the nonlinear logit function at its mean, one multiplies the logit coefficients by the quantity $((\bar{R})(1-\bar{R}))$, where \bar{R} is the mean reenlistment rate, $0 < R < 1$. To make these equations comparable to the equations reported in the text for Reen ($Reen = 100R$), we have multiplied the slopes by 100.

APPENDIX B

NAVY RATINGS AND CIVILIAN JOB CODES

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NAVY RATINGS AND CIVILIAN JOB CODES

This appendix contains the "crosswalk" between Navy ratings and civilian occupational categories that we constructed for this analysis. Specifically, table B-1 lists the acronyms for all major Navy ratings and the code numbers of any civilian occupations our panel of experts deemed comparable to each rating. Table B-2 then offers a "dictionary" to translate these civilian codes.

TABLE B-1

NAVY RATINGS AND COMPARABLE CIVILIAN JOB CODES

<u>Navy rating code</u>	<u>Comparable civilian job code(s)</u>	<u>Navy rating code</u>	<u>Comparable civilian job code(s)</u>
ABE	107	EO	72,109
ABF	107	ET	73,75,22
ABH	107	ETN	73,75,22
AC	34	EW	22
AD	71	FT	22
ADJ	71	FTB	22
ADR	71	FTG	22
AE	63,22,71	FTM	22
AG	40	GM	160
AK	60	GMG	160
AM	71,130,121,129	GMM	160
AME	68,71,130,121,129	GMT	160
AMH	68,71,130,121,129	GSE	None
AMS	68,71,130,121,129	GSM	None
AO	160	HM	31
AQ	22	HT	85,140,102,115
AS	72	IC	75,82
ASE	72	IM	75,78
ASH	72	IS	None
ASM	72	JO	60
AT	22	LI	105
AW	38	LN	60
AX	22	MA	160
AZ	59	ML	94,137
BM	None	MM	80,92,132,93, 128,130
BT	80,153	MN	None
BU	66,69	MR	81,93,102,132
CE	63	MS	158
CM	72,74	MT	22
CTA	None	MU	50
CTI	None	NC	54
CTM	22	OM	78,111
CTO	None	OS	34,35
CTT	None	OT	58,22
DK	60	PC	60
DM	21	PH	None
DP	40,56	PM	98,113
DS	73,22	PN	59
DT	31	PR	None
EA	20,21	QM	None
EM	63,75,76,22	RM	35
EN	72,74,80		

TABLE B-1 (Cont'd)

<u>Navy rating code</u>	<u>Comparable civilian job code(s)</u>	<u>Navy rating code</u>	<u>Comparable civilian job code(s)</u>
RP	None	STS	22
SH	161	SW	68,102,140
SK	60	TD	22
SM	None	TM	None
ST	22	UT	64,65,69,79
STG	22	YN	59

TABLE B-2

CIVILIAN JOB CODES AND OCCUPATION NAMES
(DRI OCCUPATION BY INDUSTRY MODEL -- LIST OF OCCUPATIONS)

1. Engineers
2. Aero-Astronautic Engineers
3. Chemical Engineers
4. Civil Engineers
5. Electrical Engineers
6. Industrial Engineers
7. Mechanical Engineers
8. Metallurgical Engineers
9. Mining Engineers
10. Petroleum Engineers
11. All Other Engineers
12. Scientists, NEC^a
13. Chemists
14. Physicists
15. Biological & Medical Scientists
16. Life & Physical Scientists, NEC
17. Mathematicians & Statisticians
18. Mathematical Specialists, NEC
19. Engineering & Science Technicians
20. Civil Engineering Technicians
21. Drafters
22. Electrical & Electronic Technicians
23. Industrial Engineering Technicians
24. Mechanical Engineering Technicians
25. Engineering & Science Technicians, NEC
26. Health Workers
27. Dentists
28. Professional Nurses
29. Physicians, Medical & Osteopathic
30. All Other Health Professionals
31. Other Health Workers
32. Technicians, NEC
33. Airplane Pilots & Flight Engineers
34. Air Traffic Controllers
35. Radio Operators
36. Technical Assistants, Library
37. Tool Programmers-Numerical Control
38. All Other Technicians, NEC
39. Computer Specialists
40. Computer Programmers
41. Computer Systems Analysts

^aNEC = Not Elsewhere Classified.

TABLE B-2 (Cont'd)

42.	Social Scientists & Other Professionals
43.	Economists
44.	Social Scientists, NEC
45.	Teachers
46.	College & University Teachers
47.	Elementary & Secondary School Teachers
48.	Vocational Education Teachers
49.	All Other Teachers
50.	Writers, Artists and Entertainers
51.	Professional & Technical Workers, NEC
52.	Business Professionals & Staff
53.	Managers, Officials & Proprietors
54.	Sales Workers
55.	Clerical Workers
56.	Computer & Peripheral Equipment Operators
57.	Computer Operators
58.	Peripheral EDP Equipment Operators
59.	Secretaries & Office Machine Operators, NEC
60.	Clerical Workers, NEC
61.	Craft & Related Workers
62.	Construction Crafts Workers
63.	Electricians
64.	Fitters, Pipelayers
65.	Plumbers & Pipefitters
66.	Refractory Materials Repairers
67.	Shipwrights
68.	Structural Steel Workers
69.	Construction Crafts Workers, NEC
70.	Mechanics, Repairers & Installers
71.	Aircraft Mechanics
72.	Auto Mechanics & Repairers
73.	Data Processing Machine Mechanics
74.	Diesel Mechanics
75.	Electric Instrument & Tool Repairers
76.	Electric Motor Repairers
77.	Engineering Equipment Repairers
78.	Instrument Repairers
79.	Maintenance Mechanics & Repairers, General Utility
80.	Marine Mechanics & Repairers
81.	Millwrights
82.	Telephone Installers & Repairers
83.	Mechanics Repairers Installers, NEC
84.	Metalworking Crafts Workers
85.	Blacksmiths
86.	Boilermakers
87.	Coremakers, Hand, Bench, Floor
88.	Forging Press Operators

TABLE B-2 (Cont'd)

89.	Header Operators
90.	Heat Treaters, Annealers, Temperers
91.	Layout Markers, Metal
92.	Machine Tool Setters, Metalworking
93.	Machinists
94.	Molders, Metal
95.	Molders, Bench and Floor
96.	Molders, Machine
97.	Molders, Metal, NEC
98.	Patternmakers, Metal
99.	Punch Press Setters, Metal
100.	Rolling Mill Operators & Helpers
101.	Shear & Slitter Setters
102.	Sheet-Metal Workers and Tinsmiths
103.	Tool and Die Makers
104.	Metalworking Craft Workers, NEC
105.	Printing Trades Craft Workers, NEC
106.	Other Craft & Related Workers
107.	Auxiliary Equipment Operators
108.	Blue Collar Worker Supervisors
109.	Heavy Equipment Operators
110.	Inspectors
111.	Lens Grinders
112.	Machine Setters, Plastic Material
113.	Patternmakers, Wood
114.	Patternmakers, NEC
115.	Shipfitters
116.	Ship Engineers
117.	Testers
118.	Craft & Related Workers, NEC
119.	Operatives
120.	Assemblers
121.	Aircraft Structure & Surface Assemblers
122.	Electrical & Electronic Assemblers
123.	Electro-Mechanical Equipment Assemblers
124.	Instrument Makers & Assemblers
125.	Machine Assemblers
126.	Assemblers, NEC
127.	Metalworking Operatives
128.	Drill Press & Boring Machine Operators
129.	Electroplaters
130.	Grinding & Abrading Machine Operators
131.	Heaters, Metal
132.	Lathe Machine Operators, Metal
133.	Machine Tool Operators, Combination
134.	Machine Tool Operators Numerical Control
135.	Machine Tool Operators, Tool Room

TABLE B-2 (Cont'd)

136.	Milling & Planing Machine Operators
137.	Pourers, Metal
138.	Power Brake & Bending Machine Operators
139.	Punch Press Operators, Metal
140.	Welders & Flamecutters
141.	Metalworking Operatives, NEC
142.	All Other Operatives
143.	Batch Plant Operatives
144.	Blasters
145.	Boring Machine Operators, Wood
146.	Coil Finishers
147.	Cutters, Machine
148.	Cutters, Portable Machine
149.	Cutter-Finish Operators, Rubber Goods
150.	Die Cutter & Clicking Machine Operators
151.	Drillers, Hand & Machine
152.	Filers, Grinders, Buffers & Chippers
153.	Furnace Operators & Tenders, Ex. Metal
154.	Winding Operators, NEC
155.	Wirers, Electronic
156.	Operatives, NEC
157.	Service Workers
158.	Food Service Workers
159.	Selected Health Service Workers
160.	Protective Service Workers
161.	Service Workers, NEC
162.	Laborers, Except Farm
163.	Farmers & Farm Workers

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